REMARKS

Claims 1-42, 48, 52 and 55-57 are cancelled; claim 45 is amended; and claims 43-47, 49-51, 53, 54 and 58-65 are pending in the application.

The Examiner objects to the title, and requests that the title be replaced with a title which is more descriptive. Applicant has amended the title, and believes that such amendment overcomes the Examiner's objection to the title. Applicant therefore requests withdrawal of such objection in the Examiner's next action.

Claims 43, 45-47, 50, 51, 53, 54 and 58-65 stand rejected as being anticipated by Jung (U.S. Patent 6,337,496B2). Applicant requests reconsideration of such rejections.

Referring first to claim 43 such recites a capacitor construction comprising a first capacitor electrode, a perovskite-type dielectric material over the first capacitor electrode, and a second capacitor electrode over the perovskite-type dielectric material. The claim further recites that the perovskite-type dielectric material comprises a first layer and a second layer, with the second layer having a different degree of amorphous content relative to crystalline content than the first layer, and that the perovskite-type dielectric material comprises barium, strontium, titanium and oxygen throughout both the first and second layers.

The Examiner cites Jung for disclosing a perovskite-type dielectric material having a different degree of amorphous content to crystalline content. Jung specifically discloses at column 5, lines 10-47 two different aspects by which a perovskite-type dielectric material can be formed to have a different amount of crystallinity within one portion than within another. First, Jung discloses at column 5, lines 15-21 that the crystalline structure within

an upper portion of a perovskite-type dielectric material (specifically PZT) will deteriorate as the material is formed due to the ratio of zirconium to titanium increasing with increasing film thickness. Thus, Jung indicates that a PZT layer 112 can have a deteriorated crystalline structure at its upper portion relative to a lower portion. The second disclosure in Jung for having a different amount of crystallinity in an upper portion relative to a lower portion of a perovskite-type dielectric material is at column 5, lines 25-43, where Jung indicates that a second perovskite-type layer 113 can be formed over the first layer 112 by depositing an amorphous perovskite material over layer 112 and then annealing the amorphous material to form a crystalline layer. Thus, Jung discloses a processing stage in which a relatively crystalline perovskite-type dielectric material 112 will have a relatively amorphous material 113 thereover.

In spite of Jung's teachings that a perovskite-type dielectric material can have portions with different crystallinity relative to one another, Jung does not suggest or disclose the claim 43 recited capacitor construction having a perovskite-type dielectric material containing two layers which differ in the degree of amorphous content relative to crystalline content relative to one another. Rather, Jung is specifically teaching that the amorphous portions of the perovskite-type dielectric materials disclosed therein are converted to crystalline materials prior to incorporating the perovskite-type dielectric materials into capacitor constructions. For instance, Jung discloses that the deterioration of the crystalline structure of layer 112 is undesired and that layer 113 is provided to "compensate" for the titanium deficiency in the upper portion of layer 112 (see, for example, column 5, lines 20-27 of Jung). Jung further teaches that titanium can diffuse from layer 113 into layer 112 to cure the crystalline structure deterioration that would

otherwise occur in layer 112. Thus, Jung is teaching that the crystalline deterioration present in layer 112 is undesired, and that such crystalline deterioration is removed prior to incorporating layer 112 into a capacitor construction. Accordingly, Jung's first teaching of a perovskite-type dielectric material having a portion with a different degree of crystallinity than another (specifically, Jung's teaching that layer 112 can have a poorer crystalline structure at the top portion relative to the lower portion) is described by Jung as being a defect which is cured prior to incorporation of the PZT material into a capacitor construction.

Jung also teaches that the second disclosed structure having an amorphous perovskite-type dielectric material over a more crystalline material (the structure having the deposited amorphous material 113 over material 112 which is described at column 5, lines 40-43 of Jung) is subjected to annealing to convert the amorphous perovskite-type dielectric material to crystalline material prior to incorporating the perovskite-type dielectric material into a capacitor construction.

For the above-discussed reasons, both of the structures that Jung discloses as having a portion of a perovskite-type dielectric material with a different degree of amorphous content relative to crystalline content than another portion are further disclosed by Jung as being treated to convert the more amorphous materials to crystalline materials prior to incorporation of the perovskite-type dielectric materials into capacitor constructions. Jung therefore does not disclose or suggest the claim 43 recited capacitor construction having a perovskite-type dielectric material therein which has a portion with a different degree of amorphous content relative to crystalline content than another portion. For at least this reason, claim 43 is not anticipated by Jung, and applicant therefore requests that

the Examiner's rejection of claim 43 as being anticipated by Jung be withdrawn in the Examiner's next action. Applicant further notes that claim 43 is not rendered obvious by Jung, and that there is no suggestion or teaching within Jung of the claim 43 recited capacitor construction having a perovskite-type dielectric material therein with such material having a portion with a different degree of amorphous content relative to crystalline content than another portion. In fact, to the extent that Jung has any teaching regarding perovskite-type dielectric materials having portions with different degrees of amorphous content relative to crystalline content than other portions, Jung specifically discloses that such is a defect of the materials which is cured prior to incorporating the materials into capacitor electrodes. Jung therefore teaches against the claim 43 recited capacitor construction, and for at least this reason Jung does not render claim 43 obvious.

Claims 46, 47, 50, 51, 53, 54 and 58-60 depend from claim 43, and are therefore allowable for at least the reasons discussed above regarding claim 43.

Referring next to claim 45, such claim is amended to place the claim in independent form. Amended claim 45 recites a capacitor construction comprising a perovskite-type dielectric material over a first capacitor electrode and having a first layer physically against the first capacitor electrode and a second layer against the first layer. The claim further recites that the second layer has a different degree of amorphous content relative to the crystalline content of the first layer, with the first layer being specifically recited to have <u>less</u> crystalline content than the second layer. Accordingly, claim 45 recites a structure wherein a more amorphous region of a perovskite-type dielectric material is physically against a first capacitor electrode and the more crystalline region of the perovskite-type dielectric material

is further from the first capacitor electrode than the more amorphous region of the perovskite-type dielectric material.

Claim 45 is allowable over Jung for at least the reason that the only structures disclosed in Jung have PZT compositions in which the more amorphous content of the composition is further from a first capacitor electrode than the more crystalline portions of the PZT layer. For instance, the layer 112 is disclosed as having a crystalline structure at a lower portion (i.e., the portion near a disclosed first capacitor electrode), which deteriorates to form a poor crystalline structure at an upper portion (the portion further from the first capacitor electrode). Accordingly, the layer 112 of Jung is exactly opposite to the claim 45 recited layer, in that the claim 45 recited layer has a relatively amorphous portion of perovskite-type dielectric material nearest the first capacitor electrode and the layer 112 of Jung has the relatively amorphous portion of the perovskite-type dielectric material furthest from the capacitor electrode. For at least this reason, claim 45 is not anticipated by Jung. Claim 45 is also not rendered obvious by Jung in that there is no suggestion within Jung that a PZT material would be formed to have a more amorphous portion physically against a first capacitor electrode. Claim 45 is further allowable over Jung for reasons similar to those discussed above regarding claim 43 in that claim 45 recited a capacitor construction in which one portion of a recited perovskite-type dielectric material has different degree of amorphous content relative to crystalline content than another portion of the dielectric material.

Claim 45 is allowable over Jung for the reasons discussed above, and applicant requests such allowance in the Examiner's next action.

Referring next to claims 61-64, such claims, like the above-discussed claim 43, recite capacitor constructions containing perovskite-type dielectric materials with portions having different degrees of amorphous content relative to crystalline content than other portions. Claims 61-64 are therefore allowable over Jung for reasons similar to those discussed above regarding claim 43, and applicant requests such allowance in the Examiner's next action.

Claim 65 depends from claim 64, and is therefore allowable for at least the reasons for which claim 64 is allowable.

Claims 44 and 49 stand rejected over Jung in combination with Eastep (U.S. Patent 6,090,443). It is noted that claims 44 and 49 depend from claim 43. It is further noted that the cited reference of Eastep does not cure the above-described defects in Jung relative to claim 43. Specifically, Eastep does not suggest or disclose a perovskite-type dielectric material incorporated within a capacitor construction and having a portion with a different degree of amorphous content relative to crystalline content than another portion, nor does Eastep suggest that the materials of Jung would be incorporated into such capacitor constructions. Accordingly, claims 44 and 49 are allowable for at least the reasons discussed above regarding claim 43 which are not shown or suggested by either Jung alone, or by Jung in combination with Eastep.

Pending claims 43-47, 49-51, 53, 54 and 58-65 are allowable for the reasons discussed above. Applicant therefore requests formal allowance of such claims in the Examiner's next action.

Respectfully submitted,

Dated: 5/5/04

By: _____

David G. Latwesen, Ph.D.
Reg. No. 38,533